Troubleshooting a Slow Windows XP Machine

Possible Issues:
1. Excess processes running
   a. When you have many processes running, the computer will try to share the CPU and RAM with all of them. This will cause all the processes to slow down.

2. Excess processes/services starting up
   a. When you have many processes/services starting up, the computer will try to share the CPU and RAM with all of them during start up which will lead to slow startup times. If the processes are designed to stay on until you shut down, then this will lead to the same issue as Possible Issue # 1.

3. Fragmented files
   a. When a file is stored on the computer, it is sometimes separated to several different places on the hard drive. When the computer tries to access a fragmented file, it will take longer to load that file into RAM because the hard drive itself will physically need to travel to all the different points that the file is located at.

4. Malware
   a. There are different types of malware that will intentionally or unintentionally eat up your RAM and CPU usage. Some malware will download more malware. When that additional malware is executed (turned on), you will likely run into Possible Issue #1.

5. Antivirus software
   a. Different types of AV software scan your computer in different ways. When your computer is scanning itself for viruses, it will usually examine every single file that exists on your hard drive as well as registry entries and running processes among other things. This is all very CPU and RAM intensive.

6. Insufficient RAM
   a. If you need to run several programs, you will need a place to store all the programs that are currently running. These programs are stored in RAM. If the programs take up more space than you have space for, some unused data in the RAM will be temporarily moved to the hard drive until it's needed again. Doing this is very slow. When you run many programs, they will be constantly be moving in and out of the hard drive. This is even slower.

7. Insufficient CPU
   a. When you run multiple programs you are not actually running things simultaneously. The CPU just gives attention to each running program so fast that it looks like it's happening at the same time. The rate at which a CPU can load and execute a given command is called the clock speed. If some programs that require attention at a higher rate than can be allocated to it, the program will appear to be running slowly. Running more programs will make it to where the CPU will need to be shared among several different programs making it take

longer to get back to a program which will result in an appearance of running slowly.

Troubleshooting:
1. Excess processes running
   a. Close some CPU intensive processes
   b. Close many less CPU intensive processes
   c. Useful tools:
      i. Task manager
      ii. tasklist.exe
      iii. tskill.exe

2. Excess processes/services starting up
   a. Modify which processes/services are to start up with the computer making sure to remove unnecessary items
   b. Useful tools:
      i. Microsoft System Configuration Utility
      ii. Autoruns
      iii. Microsoft Registry Editor

3. Fragmented files
   a. Defragment the storage mediums where the fragmented files exist.
   b. Useful tools:
      i. Disk Defragmenter

4. Malware
   a. Remove the malware using antivirus software
   b. Sometimes the malware will run as a process which can be viewed in the Task Manager. In this case, you should look for an odd process name. If you see a name you don't recognize it can be looked up on google. If in doubt, it's probably best to leave it alone.
   c. Sometimes you can find the malware starting up with the computer using autoruns, a registry editor, or the system configuration utility, in which case you might be able to keep it from starting up.
   d. Useful tools:
      i. Microsoft Registry Editor
      ii. Autoruns
      iii. Microsoft System Configuration Utility
      iv. Sophos Antivirus
      v. Spybot Search & Destroy

5. Insufficient RAM
   a. You can view how much RAM is installed by right-clicking on My Computer and clicking "properties". It will be under the "General" tab.

  b. Windows XP requires a minimum of 64 MB of RAM. Microsoft recommends 128 MB or higher. I would recommend 1 or 2 GB of RAM for good general-use performance.

  c. How to install RAM: http://www.ehow.com/how_895_install-ram.html

6. Insufficient CPU

  a. You can view some information about your processor by right-clicking on My Computer and clicking "properties". It will be under the "General" tab.

  b. Window XP requires a minimum clockspeed of 233 MHz. Microsoft recommends a processor with a clockspeed of at least 300 MHz. A CPU with 1 GHz clock speed should give decent performance, but is still considered low-end by today's standards.

Tool Information:

1. Microsoft System Configuration Utility

  a. Location: C:\WINDOWS\pchealth\helpctr\binaries\msconfig.exe

  b. Description: This utility allows you to modify more than just which services and processes start up with the computer; however, those are typically the only things you'll want to modify in the scenario of a slow computer.

  c. Howto:

    i. Click the start button, then click on "Run" (WINDOWS KEY+R). Then type "msconfig" and hit enter. Quotes are unnecessary. Alternatively you can manually navigate to its location and double click the msconfig.exe program.

    ii. From there you'll want to click "Selective Startup". This will make it so that the changes you make will be used. You'll typically want to modify the items under the "Services" and "Startup" tabs. If you're not sure what one of the items does, it's probably best not to modify it.

    iii. Note: If changes are made and you "OK" or "Apply" there will be a notice when the computer starts up telling you that the system was modified. To not have that dialog show up again, tick the check box and hit ok.

2. Sysinternals Autoruns

  a. Location: http://download.sysinternals.com/Files/Autoruns.zip

  b. Description: This utility allows you to view and modify all sorts of neat things that start up with the computer in an easy to use UI (user interface), such as startup processes, DLL's that load with the computer, scheduled tasks, services, etc.

  c. Howto:

    i. Download the utility from the given location.

    ii. Unzip the files.

    iii. Run the autoruns.exe file.

    iv. Untick the items that you don't want to start up.

    v. Close the program.

3. Microsoft Registry Editor

a. Location: C:\WINDOWS\system32\regedt32.exe
b. Description: This tool is for advanced users. This tool allows access to most of the configuration options for most installed applications as well as the settings for the operating system. The main areas to look at using this tool would be under the keys
    i. HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
    ii. HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run
Where HKEY_LOCAL_MACHINE will start up no matter what user logs in and HKEY_CURRENT_USER will only affect the user that is currently logged in.
c. Howto:
    i. Click the start button then click on "Run" (WINDOWS KEY+R). Then type "regedit" and hit enter. Quotes are unnecessary. Alternatively you can manually navigate to its location and double click the regedt32.exe program.
    ii. Navigate to the areas of interest.
    iii. It is best to export (backup) any key before you modify so that you'll have something to revert back to. All changes are final. There is no undo. The closest thing to an undo would be to re-modify the keys to how they were before, or if they were exported, you can then import them.

4. Task manager
    a. Location: C:\WINDOWS\system32\taskmgr.exe
    b. Description: The task manager will allow you to view which processes are currently running as well as statistics about the said processes, such as the RAM and CPU usage.
    c. Howto:
        i. Click the start button, then click on "Run" (WINDOWS KEY+R). Then type "taskmgr" and hit enter. Quotes are unnecessary. Alternatively you can manually navigate to its location and double click the taskmgr.exe program. You can also press CTRL+ALT+DELETE to achieve the same effect.
        ii. Open windows can be located under the "Applications" tab.
        iii. Running processes can be viewed under the "Processes" tab.
        iv. Other information can be obtained from the other tabs.
        v. Note: You will typically not want to end a process that has the username Local Service, Network Service, or System. Also, if you don't know what a process does, you can usually google the "Image Name" and find out if it may be malicious or not.

5. Command Prompt
    a. Location: C:\WINDOWS\system32\cmd.exe
    b. Description: The command prompt is a prompt that you can use to execute commands. For instance there are the basic navigation commands "cd" and "dir". You can also type "help" and press enter to view other options. The command

prompt can sometimes be used when a GUI is not available. There are different useful tools that can be used accessed through the command prompt such as "tasklist", "tskill", and "taskkill".

    c. Howto:
        i. Click the start button then click on "Run" (WINDOWS KEY+R). Then type "cmd" and hit enter. Quotes are unnecessary. Alternatively you can manually navigate to its location and double click the cmd.exe program. You can also access it through Start Menu->All Programs->Accessories->Command Prompt.
        ii. Learning to use the command prompt is beyond scope of this document. Tutorials for using the command prompt can be found at http://www.proprofs.com/webschool/story.php?title=CMD-Commands-Text-Document

6. Sophos Antivirus
    a. Location: http://software.lbl.gov/
    b. Description: "Integrated virus, spyware and adware protection in one easy-to-use software package for Windows and Macs. Single anti-virus client detects viruses, spyware and adware, suspicious behavior and files, unauthorized VoIP, IM, P2P and gaming software and removable storage devices. Award-winning anti-virus protection for Windows and Macs Stops viruses, Trojans, spyware and adware Installs quickly and is easy to use"
    c. Howto:
        i. You can download the software at the location under "Security Software"
        ii. You will typically want to have your computer automatically scan itself every night while you're not there so it doesn't interfere with your work (sever slowing down of the computer).
        iii. You will also want the software to update on its own whenever it can.
        iv. If you notice problems with the computer and you're wondering if it's a virus, you can always manually do a full system scan.

7. Spybot Search & Destroy
    a. Location: http://software.lbl.gov/
    b. Description: "Search & Destroy detects and removes spyware, a relatively new kind of threat not yet covered by common anti-virus applications. Spyware silently tracks your surfing behaviour to create a marketing profile for you that is transmitted without your knowledge to the compilers and sold to advertising companies. If you see new toolbars in your Internet Explorer that you haven't intentionally installed, if your browser crashes inexplicably, or if your home page has been "hijacked" (or changed without your knowledge), your computer is most probably infected with spyware. Even if you don't see the symptoms, your computer may be infected, because more and more spyware is emerging."
    c. Howto:
        i. You can download the software at the location under "Security Software"

     ii. You will typically want to have your computer automatically scan itself every night while you're not there so it doesn't interfere with your work (sever slowing down of the computer).

    iii. You will also want the software to update on its own whenever it can.

    iv. If you notice problems with the computer and you're wondering if it's a virus, you can always manually do a full system scan.

8. tasklist.exe
   a. Location: C:\WINDOWS\system32\tasklist.exe
   b. Description: This tool can be used from the command prompt to view what processes are currently running. This program comes with Windows XP Professional but not Home edition.
   c. Howto:
       i. Open the command prompt (5th item under **Tool Information**)
       ii. Type "tasklist" and hit enter.
       iii. A list of running processes should appear.
       iv. This is the same as viewing the processes in the task manager (4th item under **Tool Information**)
       v. View more options by typing "tasklist /?" and hitting enter.

9. tskill.exe
   a. Location:
   b. Description: This tool can be used from the command prompt to kill (turn off) an active process.
   c. Howto:
       i. Open the command prompt (5th item under **Tool Information**)
       ii. Type "tskill" press space and enter the name of the process that you want to kill.
       iii. This is the same as ending a process in the task manager (4th item under **Tool Information**)
       iv. View more options by typing "tskill /?" and hitting enter.

10. Disk Defragmenter
   a. Location: C:\WINDOWS\system32\dfrg.msc
   b. Description: Allows you to analyze and defragment different volumes that exist.
   c. Howto:
       i. Click the start button then click on "Run" (WINDOWS KEY+R). Then type "dfrg.msc" and hit enter. Quotes are unnecessary. Alternatively you can manually navigate to its location and double click the cmd.exe program. You can also access it through Start Menu->All Programs->Accessories->System Tools->Disk Defragmenter.
       ii. Select the volume that you think might need defragging.
       iii. Click "Analyze". The tool should then tell you whether or not it recommends defragging the drive.
       iv. If you choose to "Defragment" a drive, it is highly recommended that you do not use the computer while it is defragging.